Deuce/Mace
Operating Guide

1. GENERAL DESCRIPTION

These new VT Series amplifiers represent our latest effort to provide the guitarist with the proper blend of features, power, tonality and ruggedness to handle any reasonable performing requirement. Many new innovations in circuitry have been designed into these units that provide simpler and more effective operation than previous designs or circuitry. The tremendous flexibility of the preamplification and signal processing circuitry are complemented by the ruggedness of the system and unique circuitry of the vacuum tube (valve) power amplifier.

These amplifiers are basically two-channel units with two distinctly different sounds. Our Automix feature enables either or both of the channels to be used, with selection being accomplished by the remote footswitch (supplied). The Normal channel features a more mellow type of response and is especially suited to playing styles featuring heavy distortion or hard rock. The Effects channel is somewhat brighter and includes a variable middle control. In addition, the Effects channel features a built-in phase circuit that produces a wide variety of effects. Reverb operates on both channels. The rear panel features a complete set of input/output connections at signal levels compatible with most auxiliary equipment.

2. FRONT PANEL

2.1. INPUTS (A, B, C, D)

The input circuitry consists of four standard phone jacks located at the extreme left-hand side of the front panel. You will note that the jacks are arranged in a somewhat unconventional manner in order to separate their functions. The Normal Input jack is the single input for the Normal channel. This jack works in the conventional manner and connects the signal from your instrument to the input stage of the Normal channel.

The Automix Input is connected to a unique circuit that places the signal from your instrument at the input of both the Normal channel and the Effects channel. It is, in effect, a "paralleled" input between the Normal and Effects channels. Our unique analog switching circuitry enables the user to select either or both channels through the use of the footswitch. The Effects Inputs (A & B) consist of a high gain jack (A), as well as a low gain jack (B) to allow for a gain reduction to handle signals that tend to overload the Effects A input. Also, two instruments may be connected to the Effects channel at equal gain.

2.2. LED INDICATORS

The new VT Series features LED channel indicators that enable the player to instantly identify which channel or channels are active. With our exclusive Automix/analog switching circuitry, either or both channels can be utilized and controlled remotely by the footswitch. The channel selection feature of our Automix circuitry is greatly enhanced by the LED channel indicators, thus further simplifying the Automix function. These LED indicators are activated only when the Automix jack is used.

2.3. PRE GAIN CONTROLS

The pre gain controls on each channel determines the amount of signal gain in the preamp. The setting of this control determines only the amount of gain and is not an indication of power being delivered to the speaker. The pre gain operates very much as a volume control in conventional amplifiers. Please be aware that the pre gain control sets the *sensitivity* of the preamp and not the power of the amp.

2.4. POST GAIN CONTROLS

The post gain controls are each channel's master volume controls. Many interesting effects can be achieved by using the post gain control in conjunction with the pre gain control. The most common of these effects is the creating of harmonic distortion and sustain by setting the pre gain control at relatively high settings while running the post gain control at relatively low settings, thus activating the smooth distortion capability built into the preamp. The post gain control, when used with the Automix feature, make it possible to *preset* each channel for the desired volume, sustain, overdrive and tonality. The guitarist can then select and combine channels in any manner that he chooses. All this can be accomplished by presetting the amplifier and then controlling which channel or channels are activated by the use of the remote footswitch. The post gain controls also affect the noise level of the amp. In studio type environments, where loud playing is not required, lower settings of the post gain controls will significantly improve the noise of the amplifier making better quality recording possible.

WARNING: To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture.

2.5. EQUALIZATION

The type of equalization used in the VT Series has been researched very thoroughly and we have designed circuitry that yields two distinctly different types of response in order to provide the performer with maximum versatility and tonal coloration. You will find that our equalization is somewhat more effective than competing units and you will, therefore, find that settings of these controls will be somewhat different than those found on units made by other manufacturers although with proper adjustment, the VT's tonal circuitry can duplicate the tonality of most any amplifier.

2.5.1. BASS EQUALIZATION CONTROL

The bass equalization control determines the low frequency emphasis and is capable of substantially more effect than many of the more conventional passive tonal networks. For this reason, the control will tend to make the amp sound "bassy" at high settings. We have designed the circuitry to provide more tonal variation to allow you a greater range of variable tonalities.

2.5.2. MIDDLE EQUALIZATION CONTROL

The middle equalization control is located on the Effects channel only (the middle frequency response is preset on the Normal channel), and can be used to tailor the relative levels of the vital mid range frequencies. Experimentation with this middle control will show that it is very effective and enables the "voicing" of the Effects channel to be changed significantly because of its advanced circuit design.

2.5.3. TREBLE EQUALIZATION CONTROL

The treble equalization control varies the high end response of the particular channel and is extremely effective. You will note that the treble response of the Normal channel is somewhat less than that of the Effects channel. This is because of the preset middle frequency response of the Normal channel, as well as due to the built-in brightness of the Effects channel. In any case, the treble controls on both channels should provide more than adequate variations in high end response.

2.6. PHASE CONTROLS

Phasing is a rather interesting effect that involves the introduction of a variable frequency notch in the amplifier's passband that produces very characteristic sounds. Many phasor circuits have been offered as an integral part of musical instrument amplifiers. We have designed a unique phasing system into the VT Series. This phasor is capable of producing an extremely wide range of phasing effects, including tremolo/vibrato effects. When used with a touch of reverberation, it can closely approximate other popular sound effects such as those produced by rotating speakers, etc. We have designed an extremely wide-range oscillator circuit that is capable of very slow rates, as well as progressing to high rate closely associated with tremolo, as well as rates produced by rotating speakers. We have also built in a range of effects that vary from a very distinct "swooshing" phase to a very mild and subtle variation. Experimentaion will show the extreme versatility of this built-in phase circuit.

2.7. COLOR CONTROL

The phase color control is the element that determines the amount of internal feedback that sets the level of the phasing effect. In the counter-clockwise position, very subtle changes may be heard, while extremely deep phasing effects with the accompanying characteristic "swooshing" sounds are obtained at the extreme clockwise setting. Because of the unique action of this control, some degree of regeneration is introduced into the circuit in the exteme clockwise ("8", "9", "10") positions and you will note the most effect in the last quarter turn.

2.8. RATE CONTROL

The rate control determines the speed of the built-in phase oscillator. You will note that the speed is variable from extremely slow to extremely rapid, covering a far greater range than conventional phase or tremolo oscillators, in fact, effectively covering the operational range of both types. Counter-clockwise settings will produce an extremely slow speed, with advancing speed as the rate control is rotated clockwise. Please note that the rate control features an integral switch which is cut off in the full counter-clockwise position to allow the phase circuitry to cut completely out of the circuit from the front panel of the amp and without the footswitch. Please note that the phase circuitry will *not* work nor can it be controlled by the remote switch if the circuit is cut off with the switch on the rate control which takes precedence over the remote footswitch. NOTE: BECAUSE OF THE MODULATING ACTION OF THE PHASOR, IT IS A GOOD IDEA TO KEEP THE PHASE CIRCUIT CUT OFF WHEN NOT IN USE EITHER BY USE OF THE FOOTSWITCH OR WITH THE FRONT PANEL SWITCH ON THE RATE CONTROL TO AVOID MODULATING THE RESIDUAL NOISE FROM THE INPUT PREAMP; I. E., CUT THE PHASOR OFF WHEN NOT IN USE.

2.9. MASTER REVERB

To allow additional flexibility, the new reverb system in the VT Series is arranged in such a way that it works on both channels. Any signal coming from the post gain control of either channel is sent to the reverb drive circuitry, which in turn drives the reverb spring. The signal return is amplified and remixed with the clear signals of both channels and is applied to the power amplifier which drives the loudspeaker.

The reverb master control determines the amount of gain in the reverb return amplifier. Because of the extremely strong reverb drive system, you will find that adequate reverb can be obtained at relatively low master reverb settings. We have provided significantly more pickup reverb gain in order to enable deep reverb effects that might be desirable from time to time, especially when using the reverb for coloration and enhancement of the phase effect. (Very interesting combinations can be found by using varying degrees of reverb when the phase circuit is operational. When the external footswitch is plugged into the rear panel, the reverb return signal can be turned off or on by the reverb switch.)

2.10. STANDBY SWITCH

The standby switch operates by removing the high voltage power supply to the phase inverter and screens of the output tubes. When the standby switch is in the "off" or down position, the internal power amplifier is inoperative. An interesting use of the standby switch is to kill the power amplifier, while allowing full operation of the preamp, reverb system, phase circuitry and the preamp signal outputs, including line outs. If operation of the preamp only is desired, the standby switch may be used to elinimate all but preamplification and signal processing functions.

2.11. PILOT LIGHT

The pilot light indicates when the electrical supply is switched on and is actually delivering power to the amplifier.

3. REAR PANEL

The rear panel contains the necessary fusing and power (mains) switch, as well as a complete input/out jack panel. A small functional diagram is located on the rear panel to facilitate hook-ups under field conditions.

3.1. FUSE

The Fuse is located within the cap of the fuseholder and should be replaced with one of the proper value if it should fail. It is necessary that the proper type and value fuse be used to avoid damage to the equipment and to avoid voiding the warranty. If your unit repeatedly blows fuses, the unit should be taken to a qualified service center for repair.

3.2. POWER SWITCH

On domestic units, the power switch is of the three-position type with the center position being "OFF". This switch has two "ON" positions, one of which is used to ground the amplifier properly. One of the "ON" positions will yield the lowest amount of residual hum or "popping" when the instrument is touched and this is the position that should be used.

On export models, we utilize a simple on/off switch that does not have multiple "ON" positions since the grounding (earthing) conditions vary with the different electrical systems of North America versus other nations.

3.3. LINE CORD

For your safety, we have incorporated a three-wire line (mains) cable with proper grounding facilities. It is not advisable to remove the ground pin under any circumstances. If it is necessary to use the amp without proper grounding facilities, suitable grounding adaptors should be used. Much less noise and greatly reduced shock hazard exists when the unit is operated with the proper grounded receptacles.

3.4. SPEAKER OUTPUTS

The speaker outputs utilize standard phone jacks and we have provided both 8-Ohm and 4-Ohm taps off the output transformer to enable these amps to be used with an extremely wide range of speaker systems, both internal and external. Please be aware that mismatched impedance has some effect on the overall performance of the unit.

3.5. REMOTE SWITCH SOCKET

The remote switch socket is the standard "DIN" type and serves as the chassis connection for the *supplied* remote footswitch. Please note that the "DIN" plug has an indentation that must be mated with the matching indentation in the footswitch receptacle on the rear panel. This keying action allows the footswitch

to be connected only in the proper manner. If the plug is forced or undue pressure is exerted on the shell or pins, damage could result to the footswitch plug or the chassis mounted socket. As with any precision device, reasonable care should be exercised.

3.6. PREAMP OUT/POWER AMP IN

To allow "in line" patching of various accessories, we have included a unique system of preamp out/power amp in jacks on the rear panel. The preamp out is the straight preamp signal which is the sum of the outputs of the two channels plus reverb. This output level is approximately 2 Volts RMS and is a relatively low (600 Ohms) output impedance. The preamp output signal is connected through a switching contact to the power amp input jack and normally the preamp out is connected to the power amp's input. This circuit allows basically two modes of operation. When signal is taken out of the preamp, signal is also delivered to the internal power amplifier. If access to the internal power amplifier is needed or if some accessory device such as a noise gate, delay line, etc., is to be patched "in line", then the *preamp output* signal must be connected to the *auxiliary unit's input*, while the *auxiliary unit's output* must be connected to the *power amp input*, thereby placing the auxiliary unit in series or "in line" with the normal signal path. With this unique patching facility, many interesting effects can be accomplished.

3.7. LINE OUT

Many attempts have been made over the years to patch the preamp circuitry of musical instrument amplifiers directly into recording or sound reinforcement mixing consoles. Most of these attempts have been unsuccessful and have resulted in players and soundmen having to utilize various forms of what is popularly referred to as a "direct box" which, of course, means further complication, expense, etc. Most previous attempts at patching signals out of musical instrument amplifiers have ignored a very basic fact...generally poor frequency response from the musical instrument amplifier's speaker system. Most manufacturers have compensated for the speaker's poor top end frequency response by building in some degree of high frequency boost in order to satisfy the player. While this built-in high frequency boost is indeed good for increasing the response from the system, it tends to cause excessive residual noise, as well as "strident" or "screechy" tonality in the direct preamp output signal. Our line output has a built-in treble compensation circuit that very closely matches the rolloff characteristic of the speaker system in order to produce an output signal that corresponds very closely to what's being heard from the speaker system. There is also a rolloff of the extreme low frequencies to avoid overload of the associated console by the deep bass signals. This very important feature should prove very helpful in eliminating the need for direct boxes and micing of musical instrument amplifiers. The signal from the line output jacks are low impedance (600 Ohms) unbalanced at a signal level of 2 Volts RMS.

3.8. MACE BALANCED (SYMMETRICAL) OUTPUT

The 600-Ohm transformer balanced line out on the Mace is provided to eliminate the need for external matching transformers/micing/direct boxes, etc., and provides the same frequency compensated signal as does the 600-Ohm unbalanced line out. (Please note that the preamp out signal is not frequency compensated, while the line outputs are.)

"Specifications are subject to change without notice."

MACE SPECIFICATIONS

Output Power:
160 Watts RMS @ 5% THD into 4 Ohms
Total Available Gain:
55 dB (EQ flat)
Signal-To-Noise Ratio:
75 dB (Volume 12:00 Master 12:00)
Minimum Input Voltage for Rated Output:
50 mV
Preamp Output:
2 Volts RMS into 600 Ohms (@ rated output)
Line Output Impedance:
600 Ohms Transformer Balanced
Line Output Level:
2 Volts RMS into 600 Ohms (@ rated power)

DEUCE SPECIFICATIONS

Output Power:
120 Watts RMS @ 5% THD into 4 Ohms
Total Available Gain:
55 dB (EQ flat)
Signal-To-Noise Ratio:
75 dB (Volume 12:00 Master 12:00)
Minimum Input Voltage for Rated Output:
50 mV
Preamp Output:
2 Volts RMS into 600 Ohms (@ rated output)

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